Health Canada Santé Canada

Canada

Opportunities to Protect Canadians from the Health Impacts of Climate Change

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Climate Change and Corporate Knowledge Transfer Bureau

Safe Environments Directorate

Health Canada

Clean Air Hamilton
Upwind- Downwind Conference
February 22, 2016

YOUR HEALTH AND SAFETY... OUR PRIORITY.

Outline

- How the Climate is Changing
- Risks to Health
- Adaptation to Prepare Canadians
- What Health Canada is Doing

How the Climate is Changing

Christmas in Ottawa – December 24, 2015

AUTOS HOMES CLASSIFIEDS CAREERS OBIT

OTTAWA SUN
MONDAY JANUARY 4 2016

HOME NEWS SPORTS ENTERTAINMENT LIFE TECH MONEY TRAVEL C

OTTAWA & REGION ONTARIO CANADA WORLD WEIRD ARCHIVES

NEWS OTTAWA & REGION

Record temps in store for Christmas Eve day

BY JULIENNE BAY, OTTAWA SUN

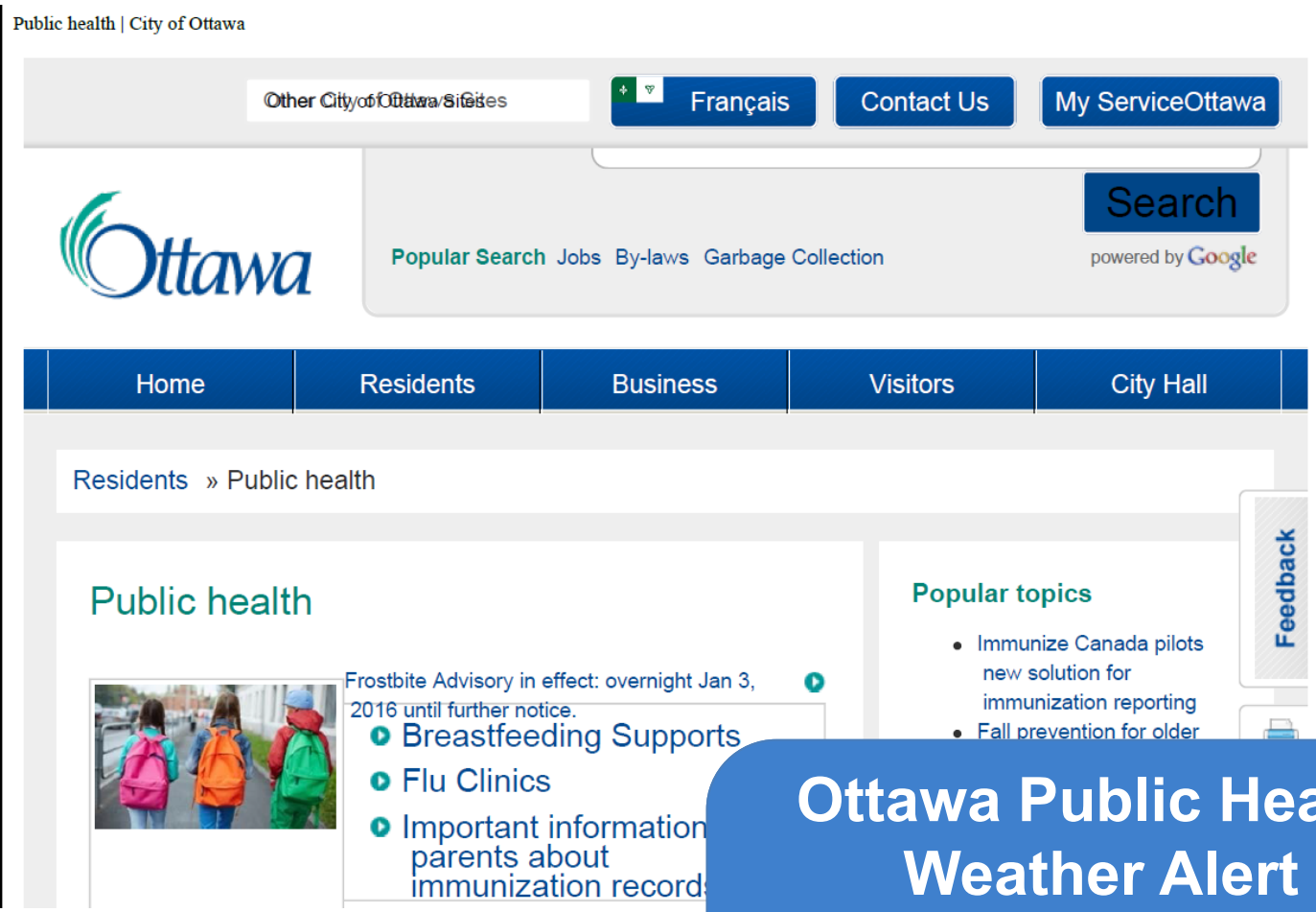
FIRST POSTED: THURSDAY, DECEMBER 24, 2015 09:49 AM EST | UPDATED: THURSDAY, DECEMBER 24, 2015 01:42 PM EST

Dec 24, 2015

High of 16.7°C

http://www.ottawasun.com/2015/12/24/record-temps-in-store-for-christmas-eve-day

New Years in Ottawa – January 4, 2016



Ottawa Public Health Weather Alert

A Frostbite Advisory is in effect overnight January 3, 2016 until further notice.

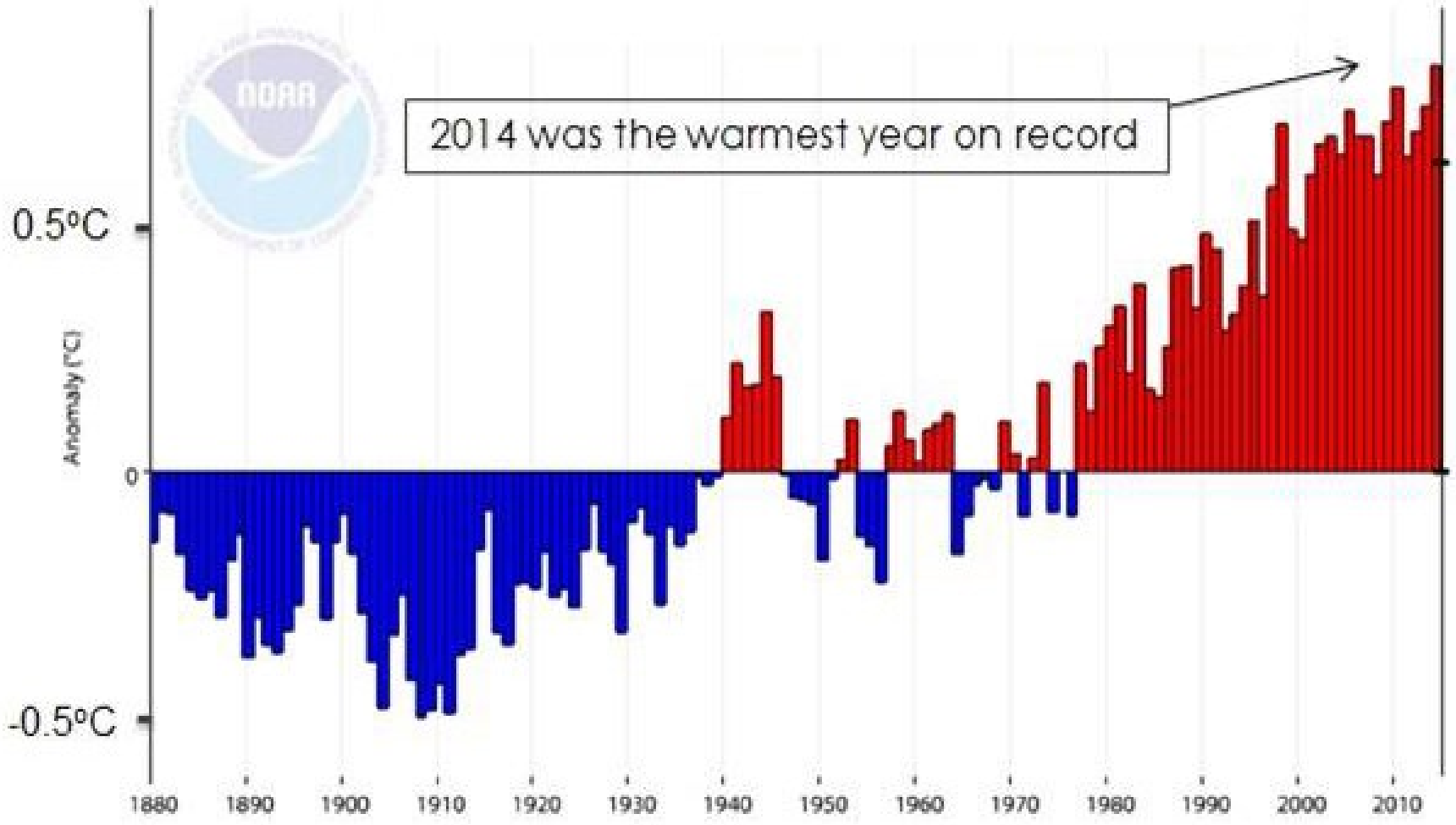
High of -13°C and low of -21°C at night.

http://www.cbc.ca/news/canada/ottawa/frostbite-ottawa-2016-1.3387674

Evidence of Climate Change - “Warming is unequivocal”

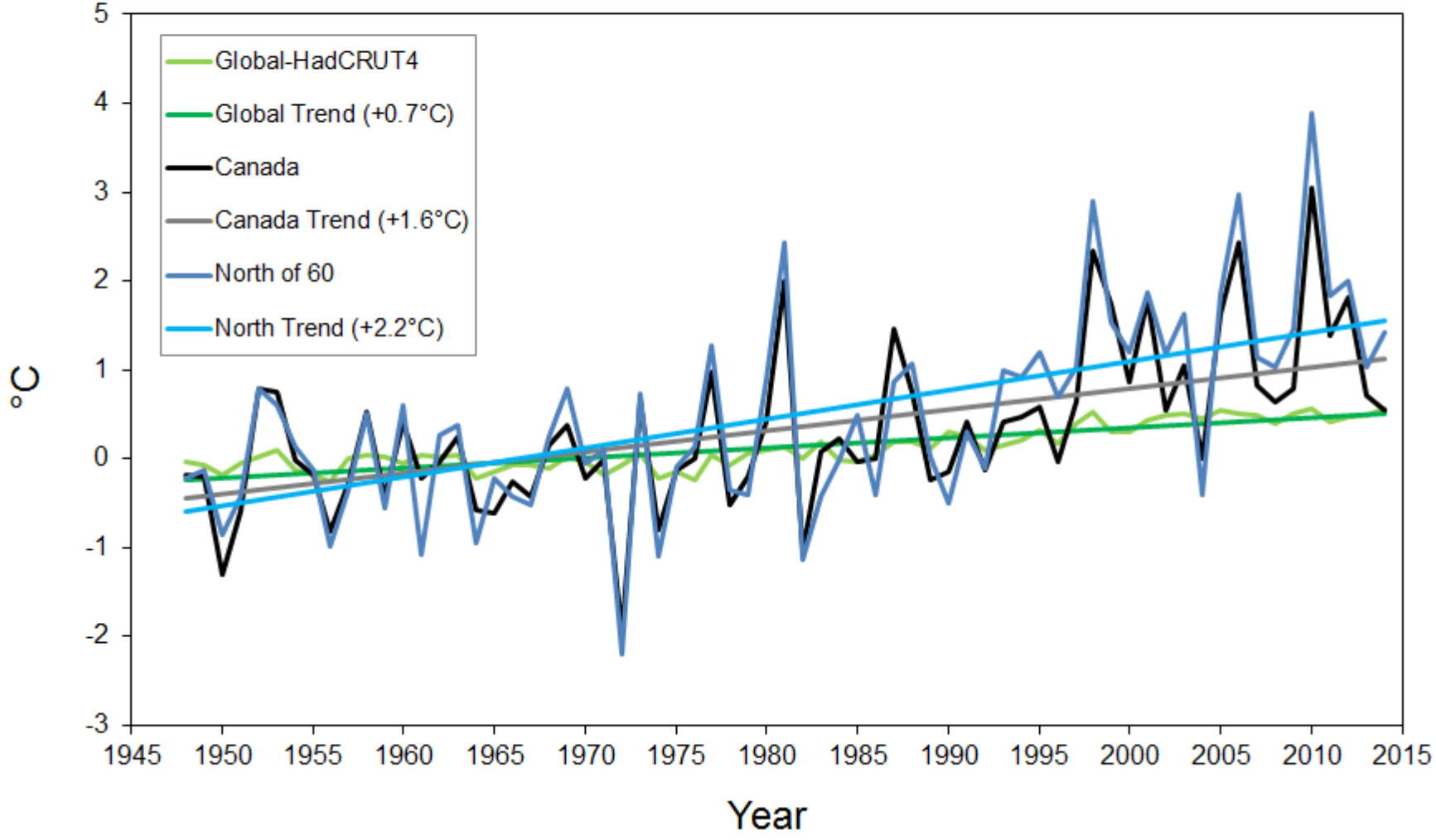
Global Land and Ocean Temperature Anomalies, January - December

(Annual anomalies relative to 20th century)



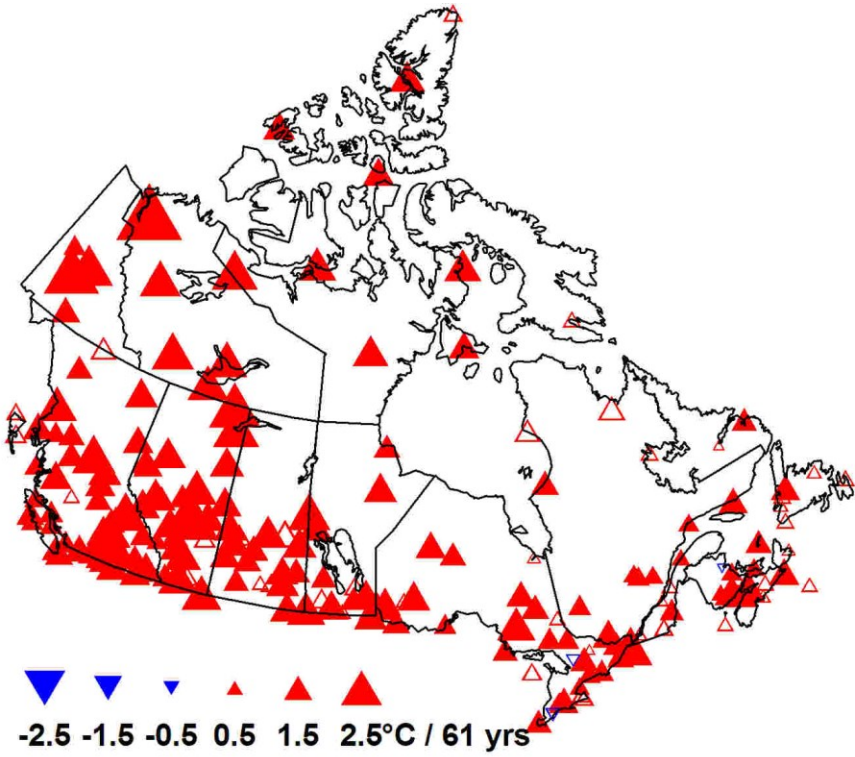
NOAA, 2015

Annual Global, National, and Northern Canada mean temperature departures and long-term trend, 1948-2014



Changes are occurring across all climate aspects, consistent with observed warming

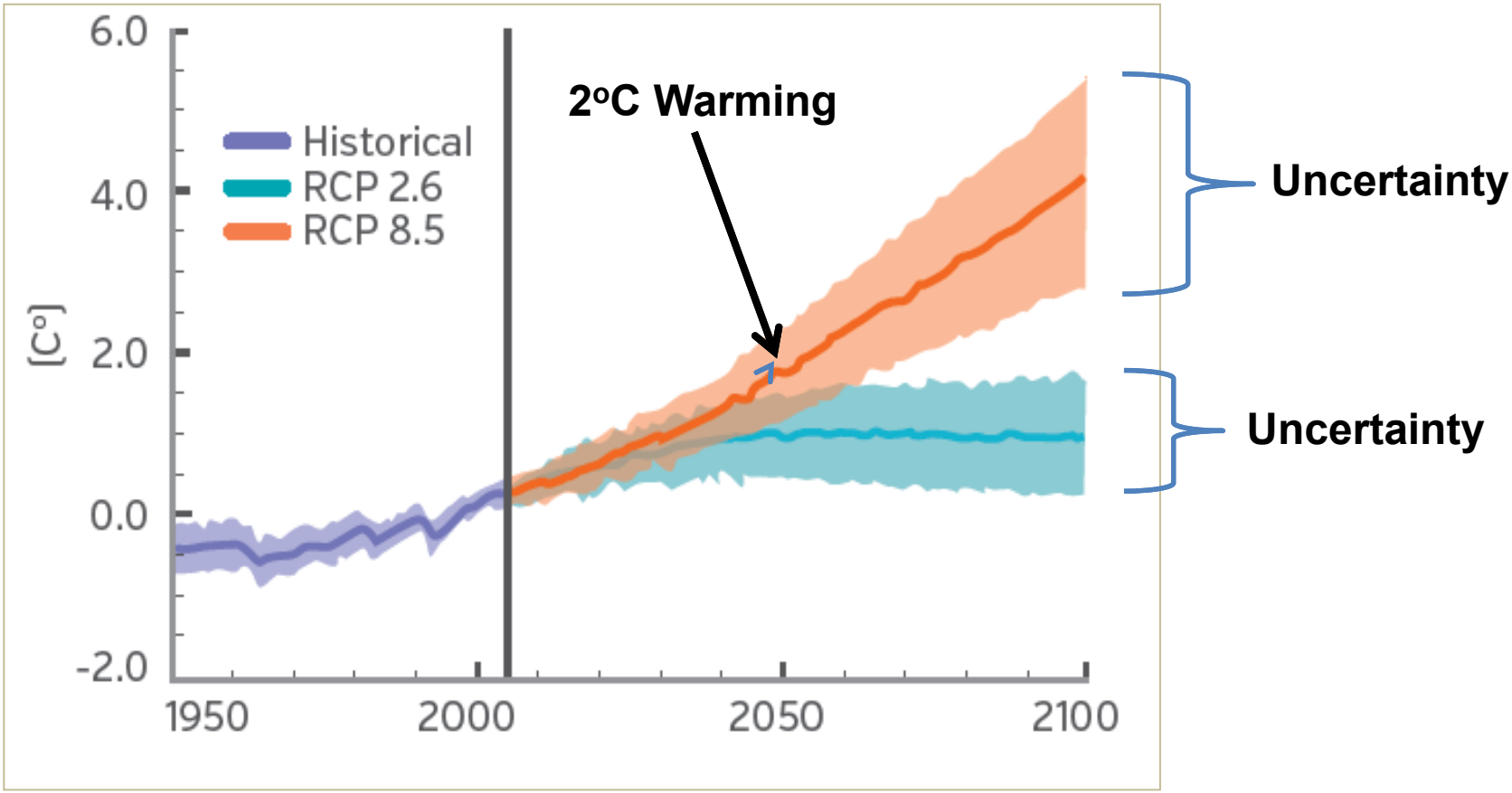
- Longer growing season
- Higher cooling degree days but lower heating degree days
- More heat waves and less cold spells
- Thawing permafrost
- Earlier river ice break-up
- Increase in precipitation over large parts of Canada, more snowfall in northwest Arctic.
- Earlier spring freshet / runoff



Spatial distribution of observed temperature increase

See: Vincent et al., 2015: J. Climate, **28**, 4545-4560

Projected Global Average Surface Temperature Change



(IPCC, 2013)

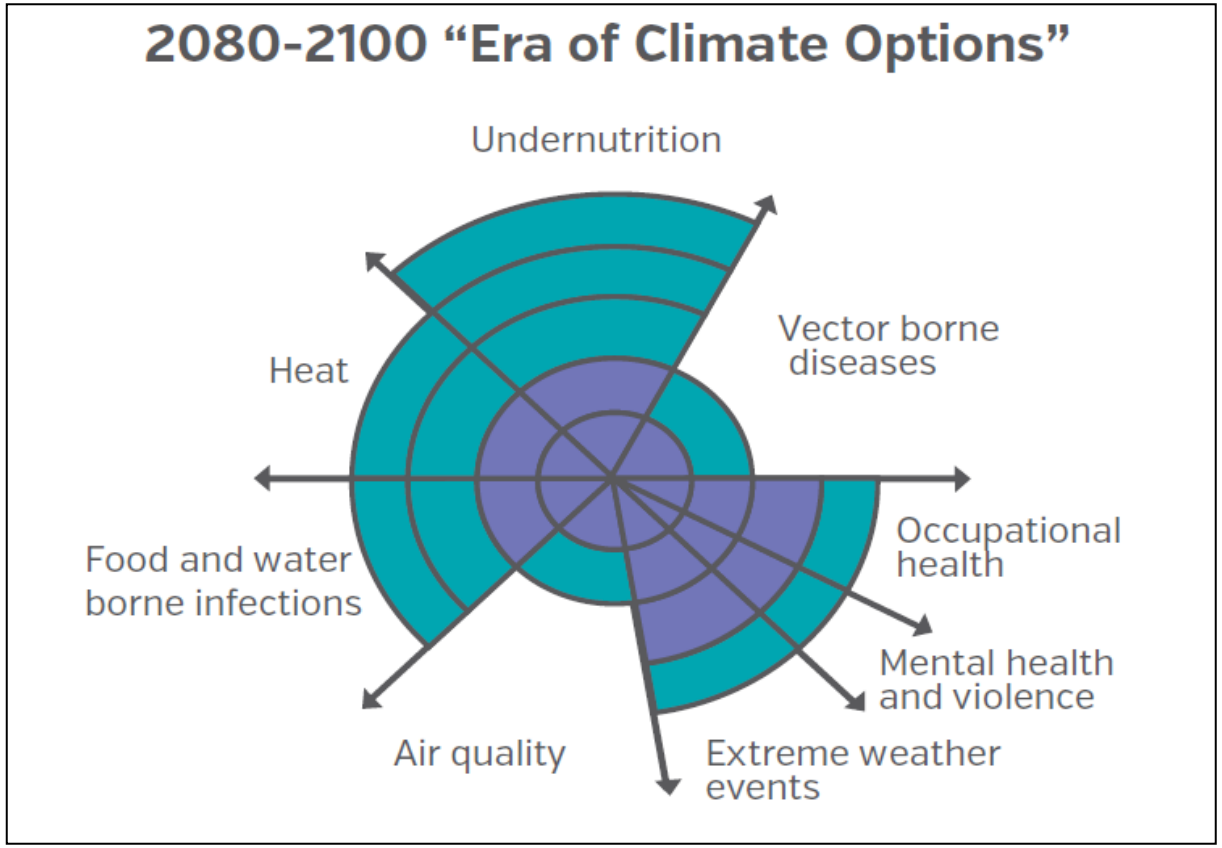
The current pace of environmental change is largely unprecedented in Earth's history (Schmidt, 2016)

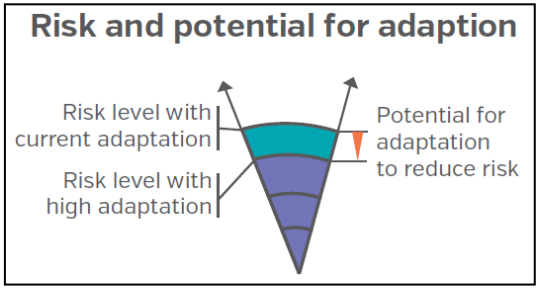
Risks to Health

Growing Knowledge of Health Impacts

- Climate Change and Health in British Columbia (2010)
- Climate Change: Mastering the Public Health Role (2011)
- Climate Change, the Indoor Environment, and Health (2011)
- Climate Change and Communicable Diseases in the EU Member States
- USA - Climate Change and Health - A Human Health Perspective on Climate Change (2010)
- Collaborative Change – A Communication Framework for Climate Change Adaptation and Food Security (2010)
- IPCC – Impacts, Adaptation and Vulnerability (2014)

Future Global Health Impacts from Climate Change





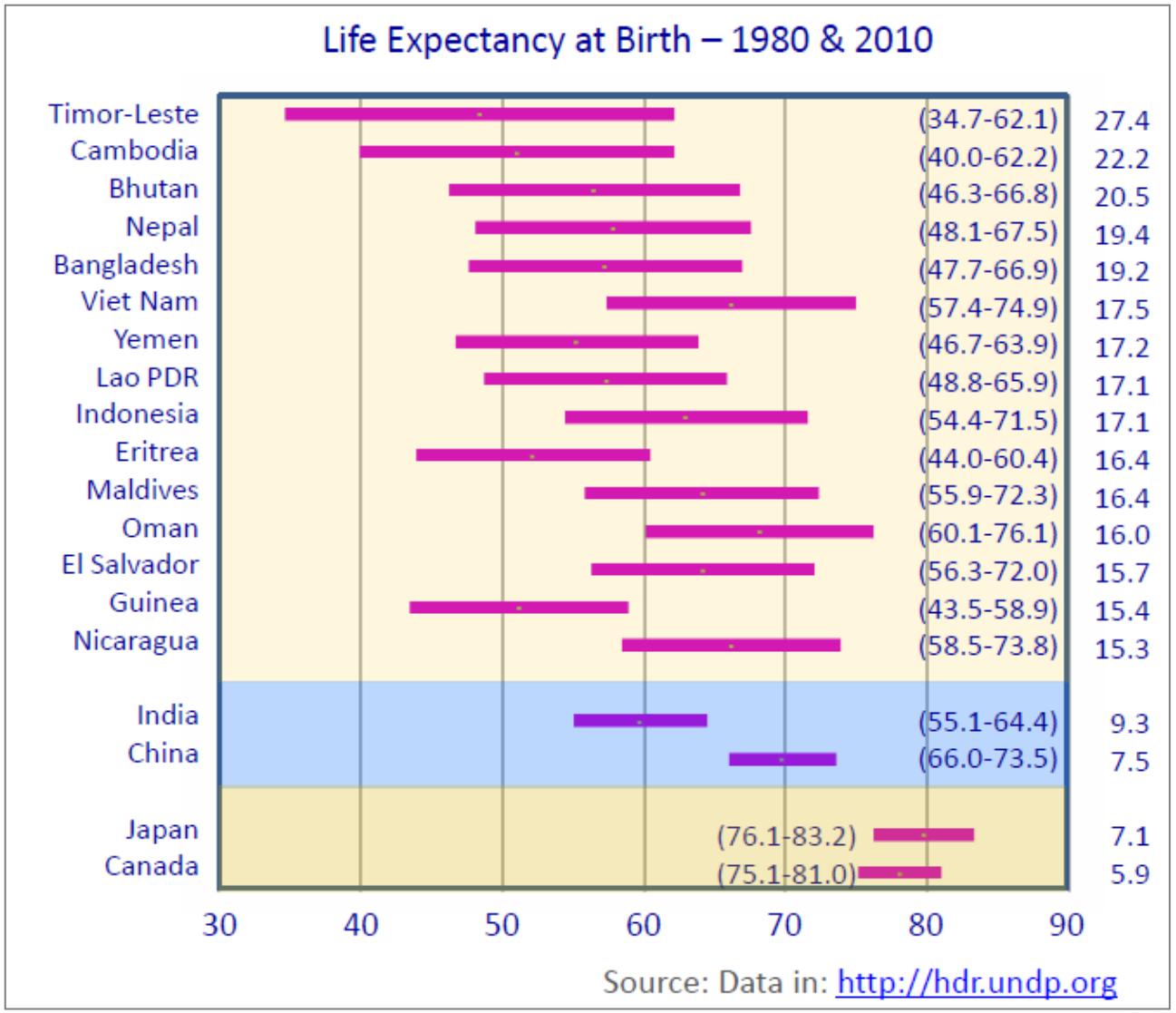
(Smith et al., 2014)

Climate change is expected to cause an additional 250,000 deaths globally per year by 2030 (WHO, 2015)

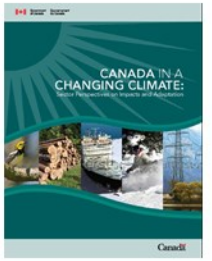
Historic Health Gains at Risk

Over the last 55 years, death rates in children under 5 years of age has decreased from 214 per 1000 live births to 59.

Over the same time, life expectancy has increased from 47 years to 69 years.



Health Risks in Canada from Climate Change



Dangerous travelling conditions

Permafrost melt damaging infrastructures

Changes in drinking water quality and quantity

Food security - changing animal distributions

Heat-related illnesses and deaths

Health impacts from more severe storms

Psychosocial impacts from droughts

Water-borne diseases from floods

Respiratory illnesses from forest fires

Expansion of Lyme Disease vector

http://www.rncan.gc.ca/environnement/impacts-adaptation/evaluations/10030

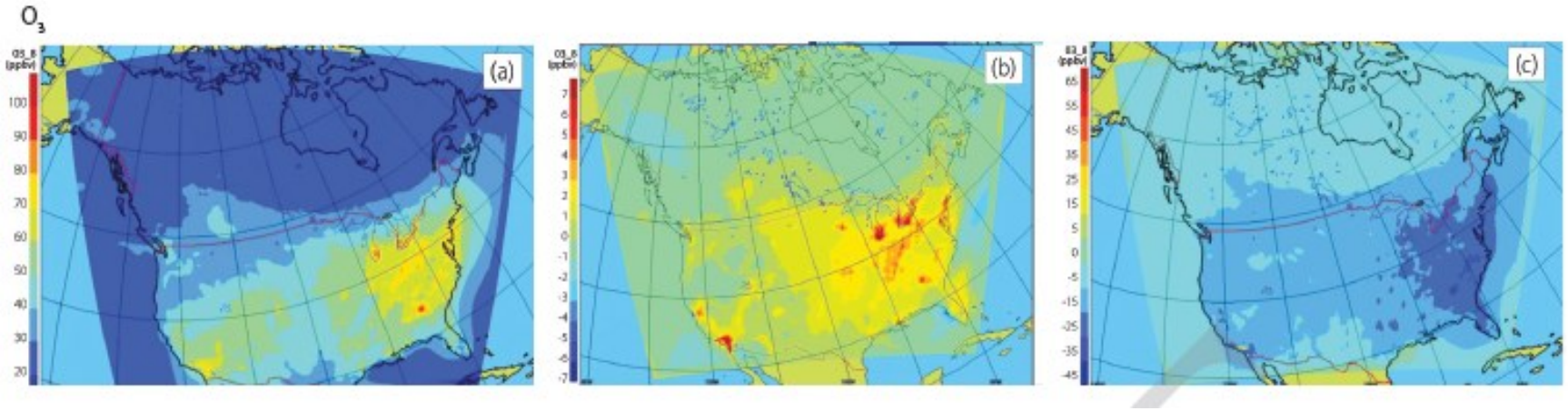
Impacts on Air Quality

- Ground-level ozone
- Particulate matter
- Aeroallergens (eg., from trees, grasses, weeds, moulds, dustmites)
- Fungi and infectious bacteria
- Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs)
- Carbon monoxide (CO)

Impacts on Air Quality

Ambient Air

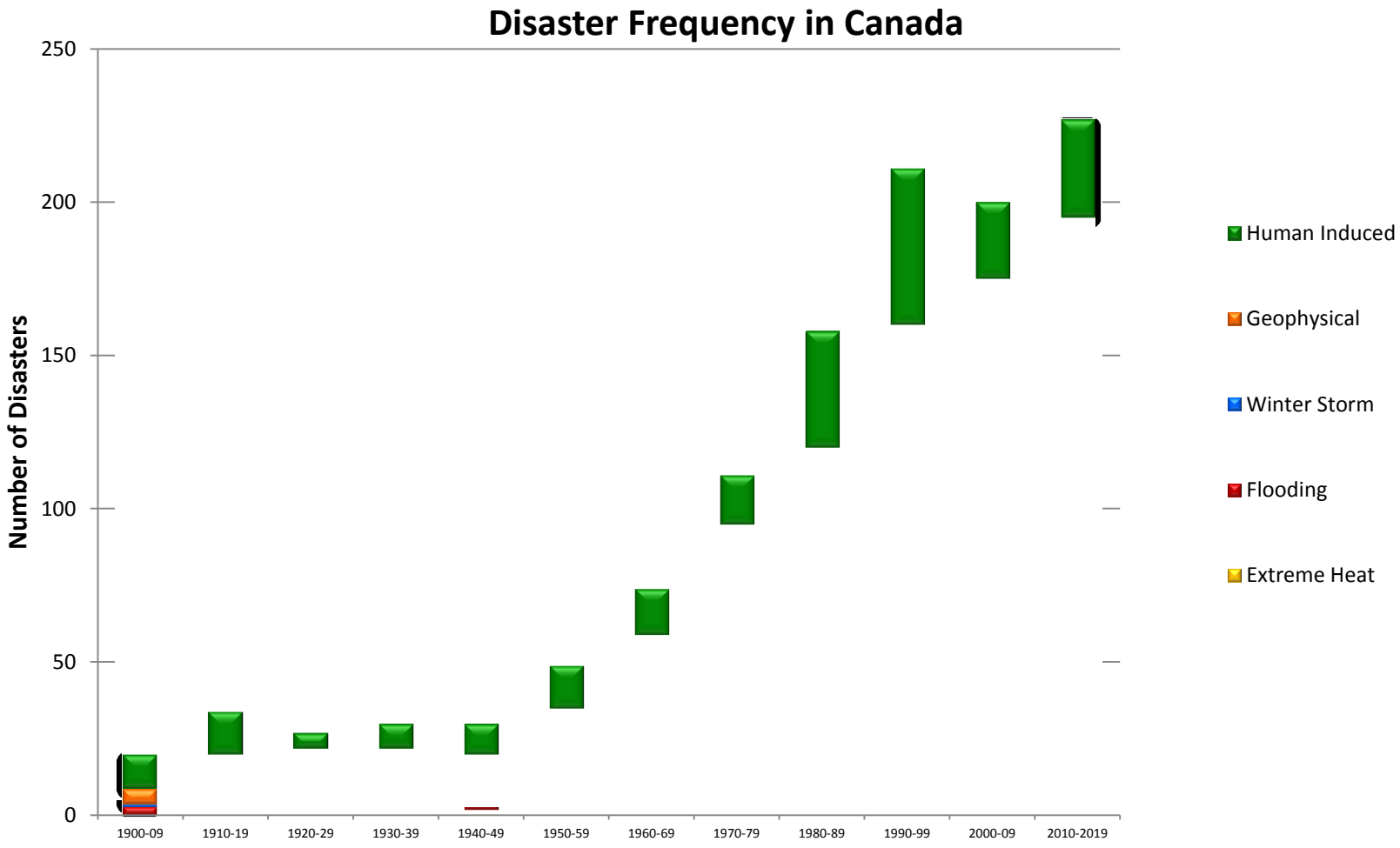
Climate change will increase health risks from poor air quality



Between 1995 and 2009, the length of the ragweed season increased by 27 days in Saskatoon and 25 days in Winnipeg

Kelly et al., 2012

Disaster Trend in Canada



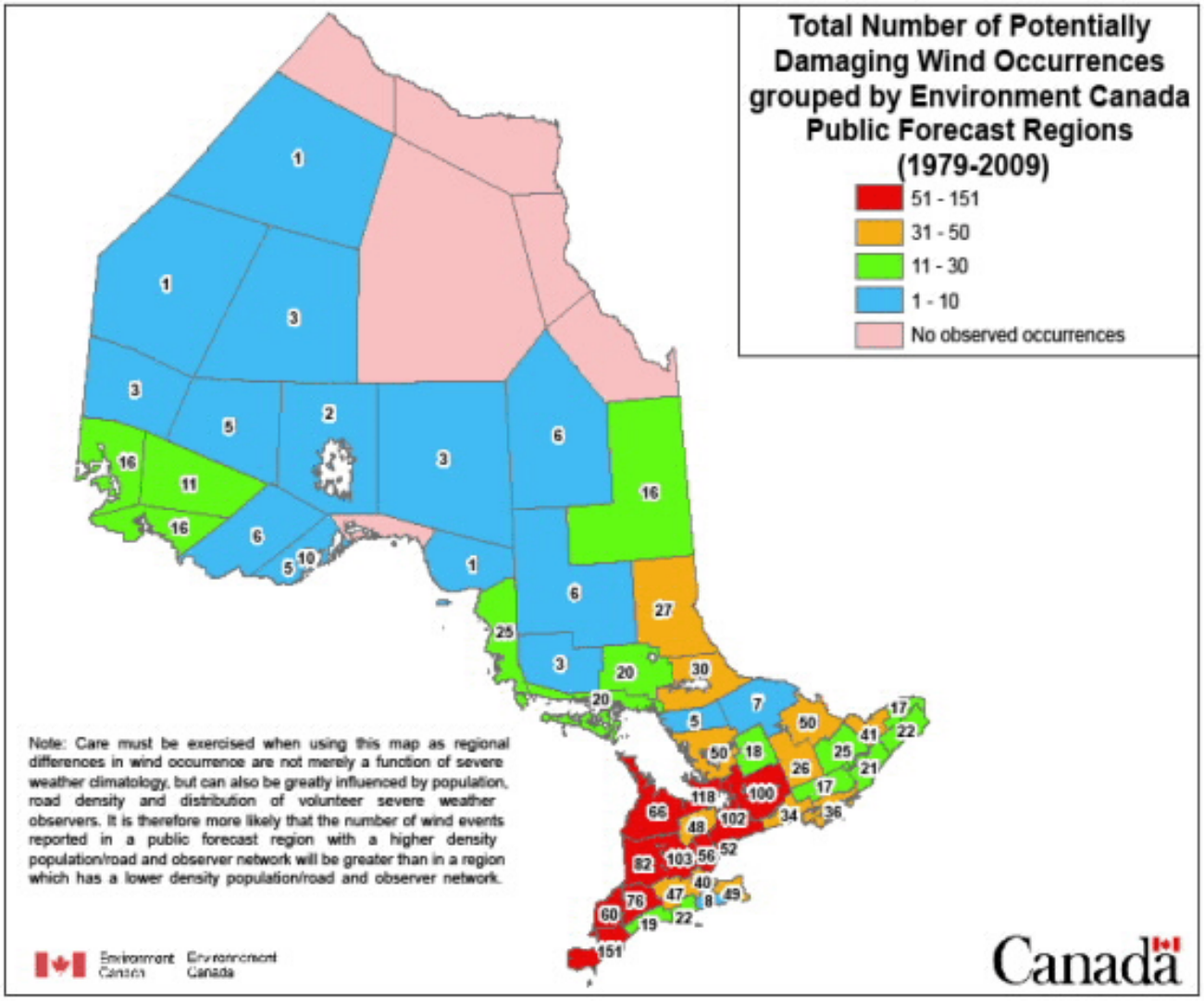
Recent Weather-Related Disasters in Canada

2010: BC Flooding – Parts of the central coast and northern Vancouver Island suffered severe flooding in September 2010 resulting in roads being washed away, evacuations and as state of emergency (Port Hardy).

2013: Calgary Flood - In the days leading up to June 20, 2013, Alberta experienced heavy rainfall that triggered catastrophic flooding which was the worst in provincial history Four people were confirmed dead as a direct result of the flooding and over 100,000 people were displaced throughout the region. Total damage estimates exceeded $5 Billion.

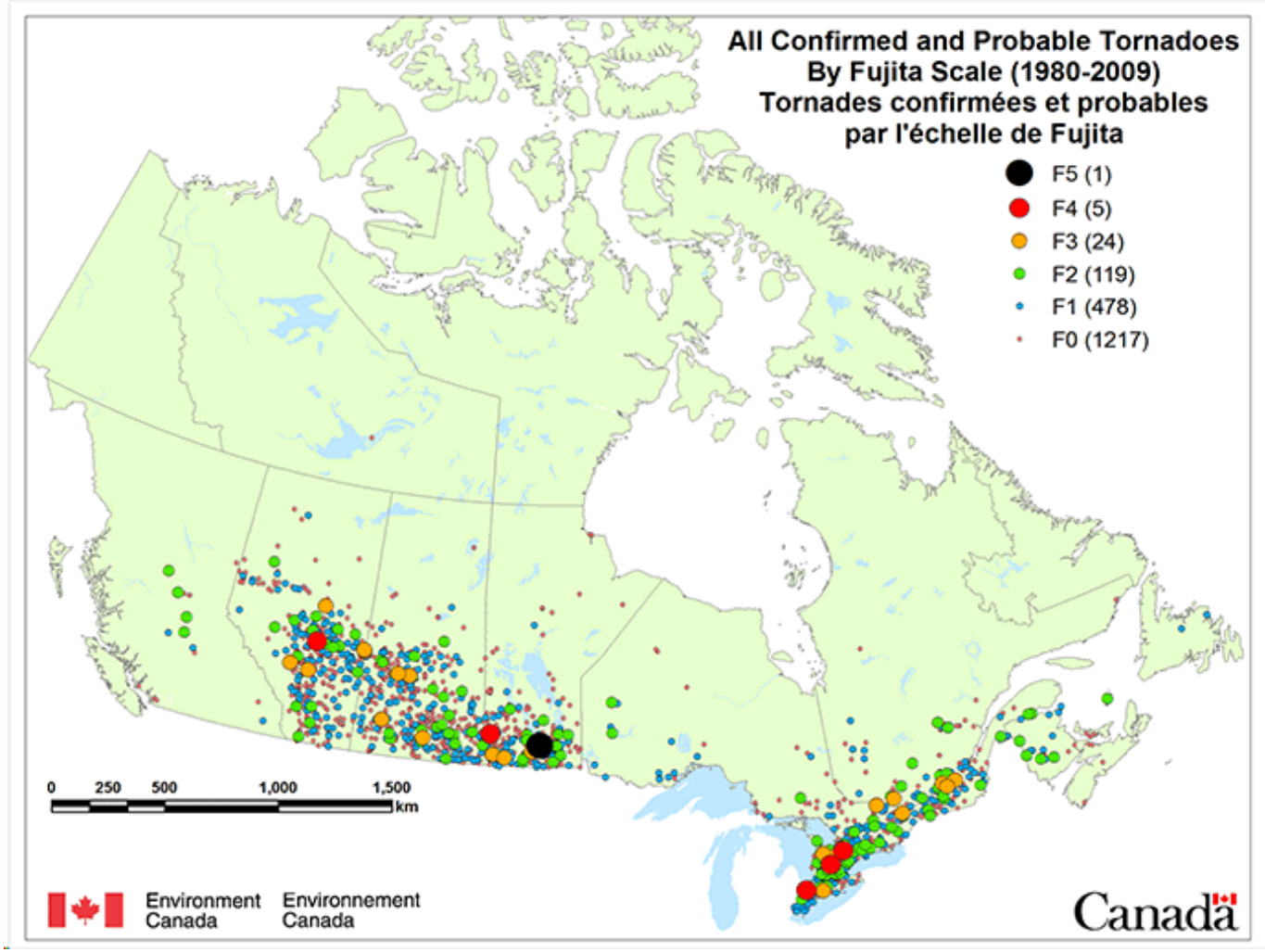
2011: Wildfires and then Floods in Slave Lake - One-third of the homes and businesses in Slave Lake (about 400 structures) were incinerated in the wildfires in May 2011. Total damage was $700 Million. Three weeks after the fire storm 17 consecutive days of rain caused widespread flooding as did another deluge July 7-9.

Extremes Winds in Ontario



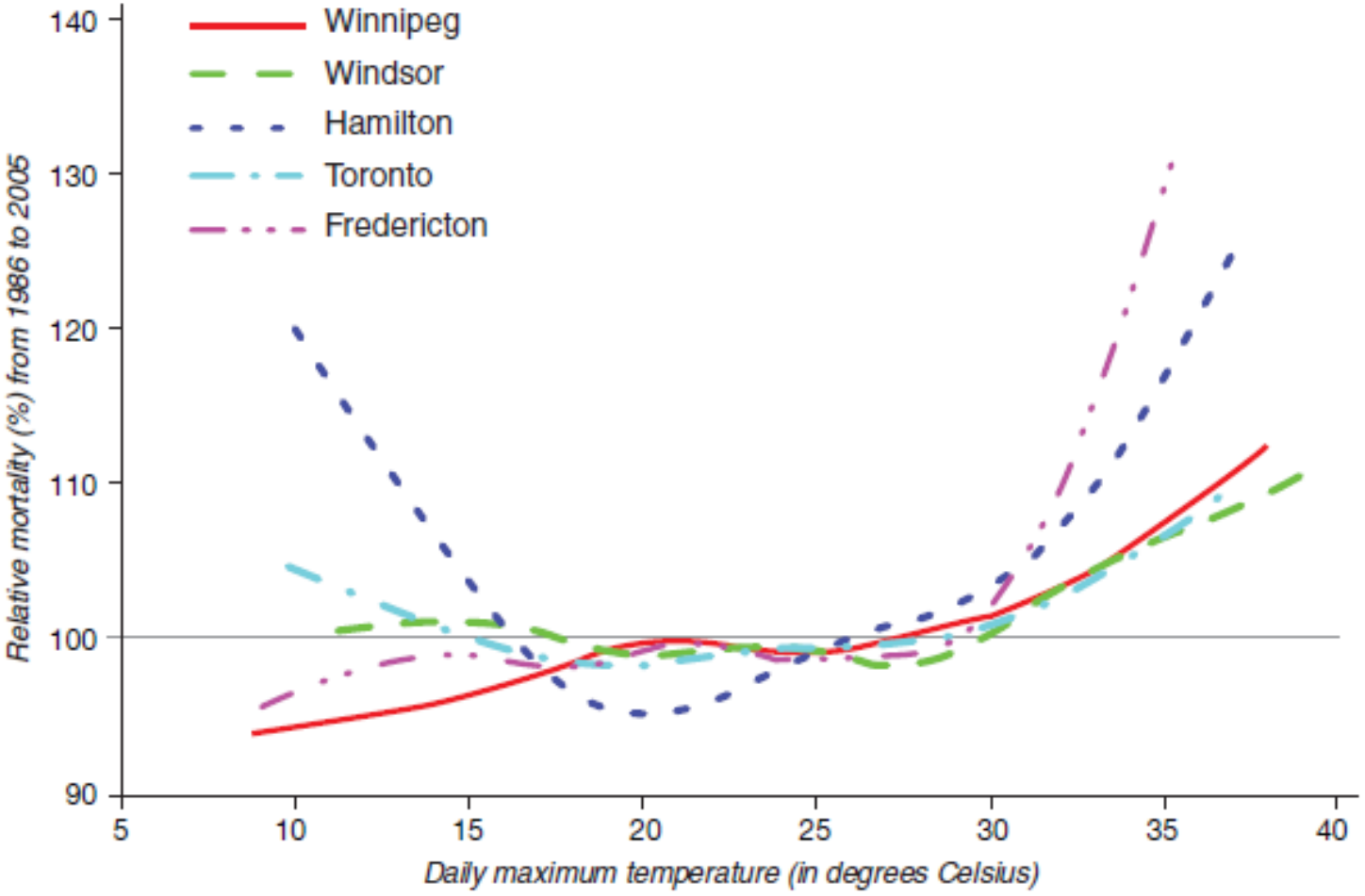
https://www.emergencymanagementontario.ca/english/emcommunity/ProvincialPrograms/hira/hira_2012.html

Tornado Occurrences and Intensities in Canada: 1980 - 2009



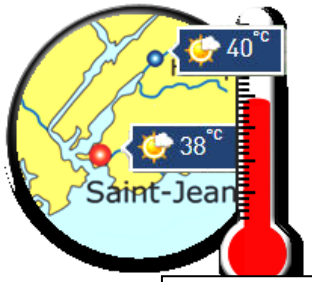
https://ec.gc.ca/meteo-weather/default.asp?lang=En&n=6C5D4990-1

Temperature/Mortality Relationships in Select Cities



Health Canada, 2011

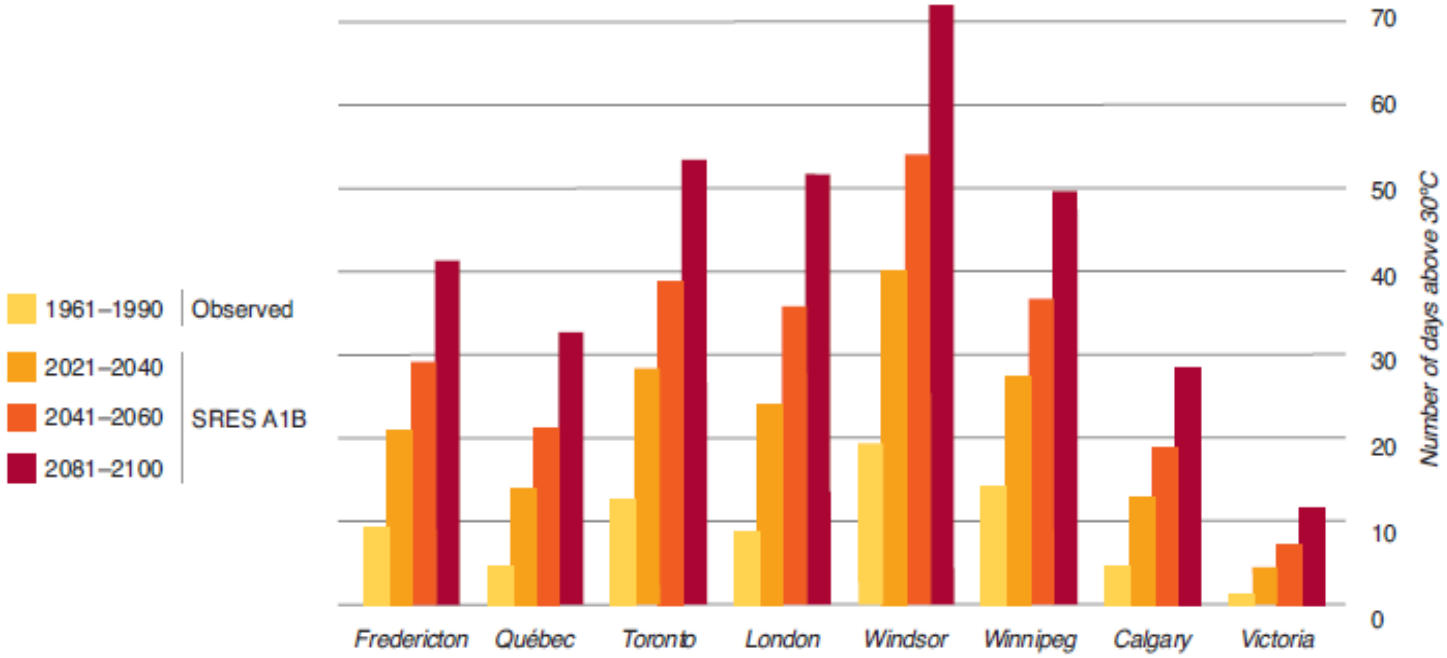
Extreme Heat



"As the climate changes, the frequency, intensity and duration of these event are expected to increase, as are their related adverse health effects" – Health Canada, 2011

Figure 1: Current and projected number of days exceeding 30°C/86°F for Canadian cities

The number of hot days for each city is based on the observed temperature data between 1961 and 1990, and projected for 2021–2040, 2041–2060 and 2081–2100.



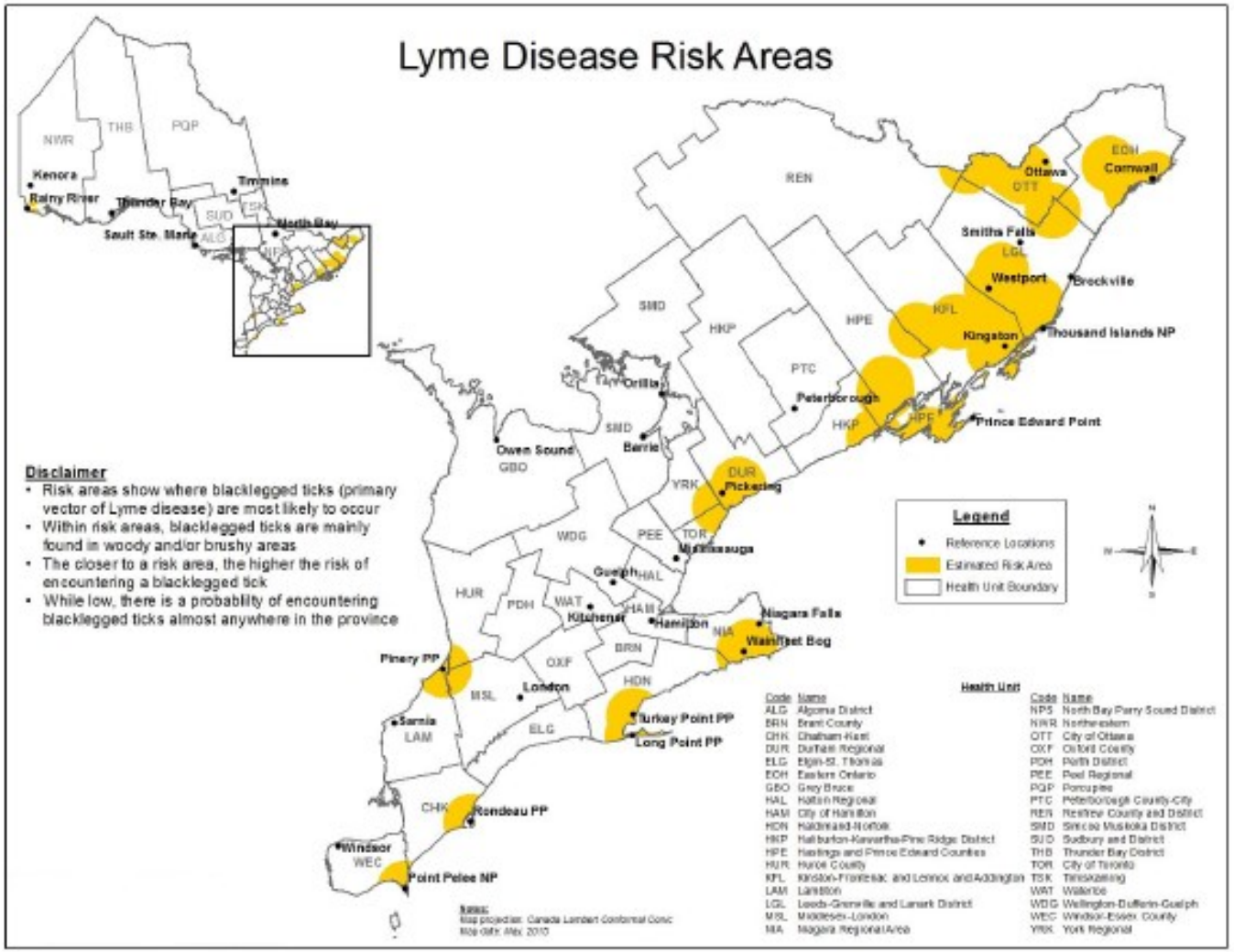
Source: Caseti et al., 2013

Drought Impacts

- Droughts can lead to and increase in **water borne pathogens** and water contamination leading to gastroenteritis
- Droughts can facilitate spread of certain **vector-borne diseases** and decreased food availability
- Droughts can also impacts **air quality** through:
  - Increases in fine particle matter, allergen and dust concentrations
  - Increases in NO_2 concentrations --- silo-filler's disease
  - Increases in forest fires

Lyme Disease Risk Areas in Ontario

Public Health Ontario | Santé publique Ontario

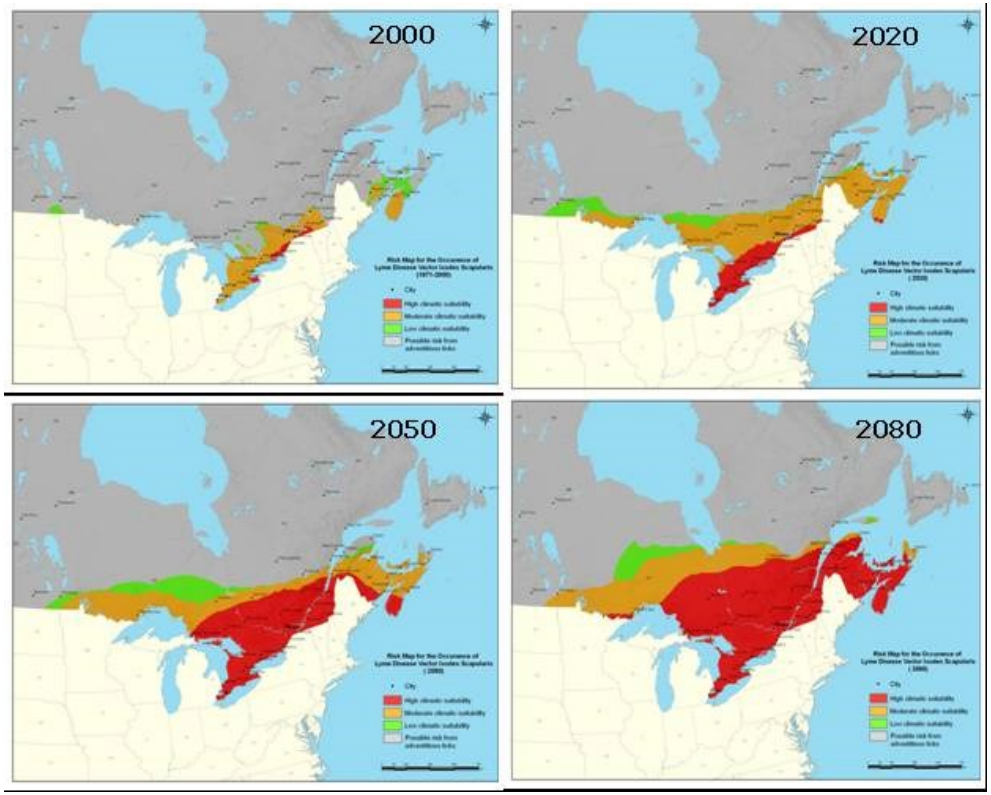


Public Health Ontario, 2015

Vector-Borne Diseases

"*Changes in weather and climate that affect transmission of vector-borne diseases include temperature, rainfall, wind, extreme flooding or drought, and sea level rise*." – WHO, 2003

- Ticks and Mosquitos are carrying diseases further into Canada
- The Lyme disease vector is spreading into Canada at a rate of 35-55km/year



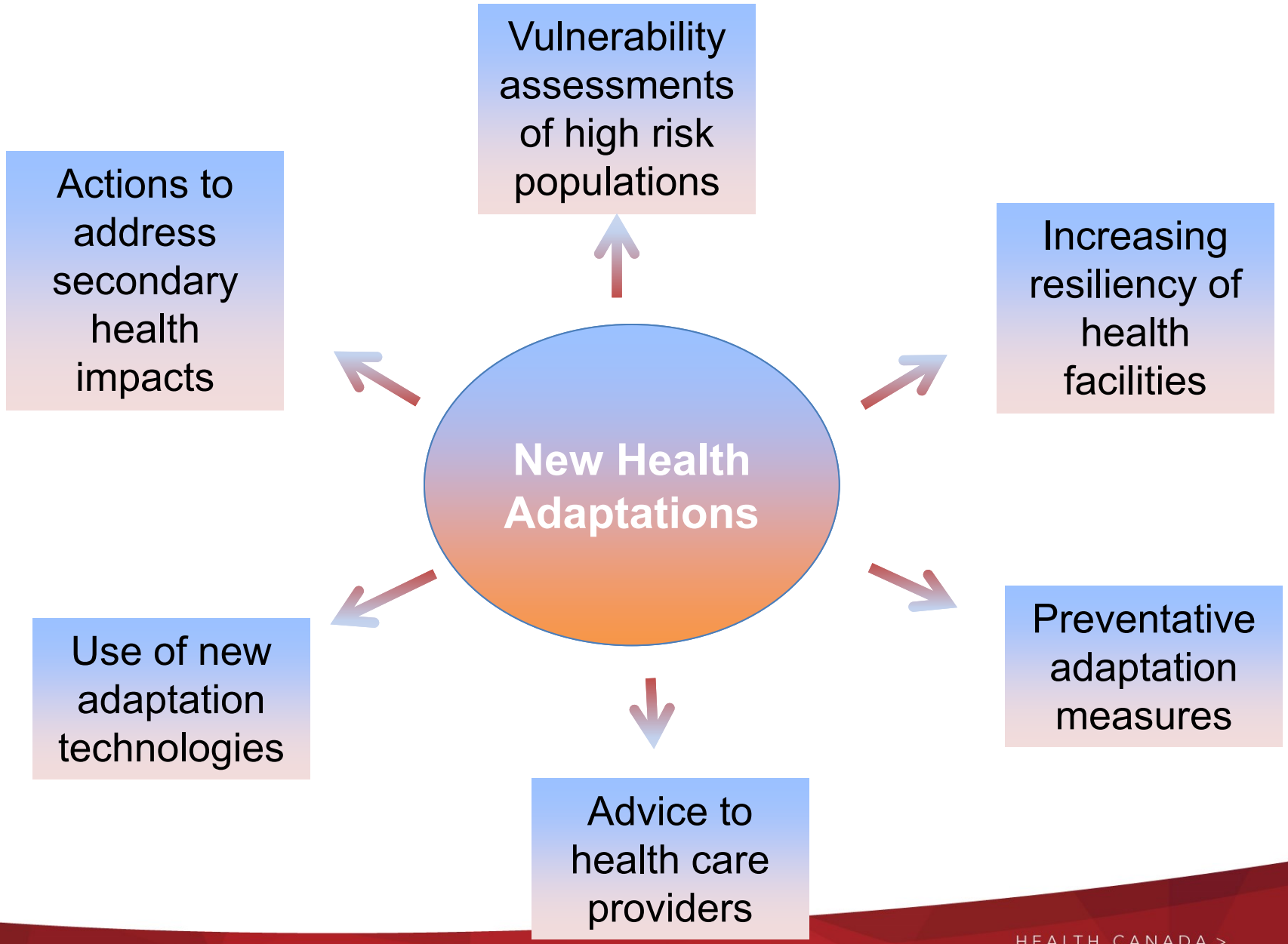
Ogden et al., 2008

Adaptation to Prepare Canadians

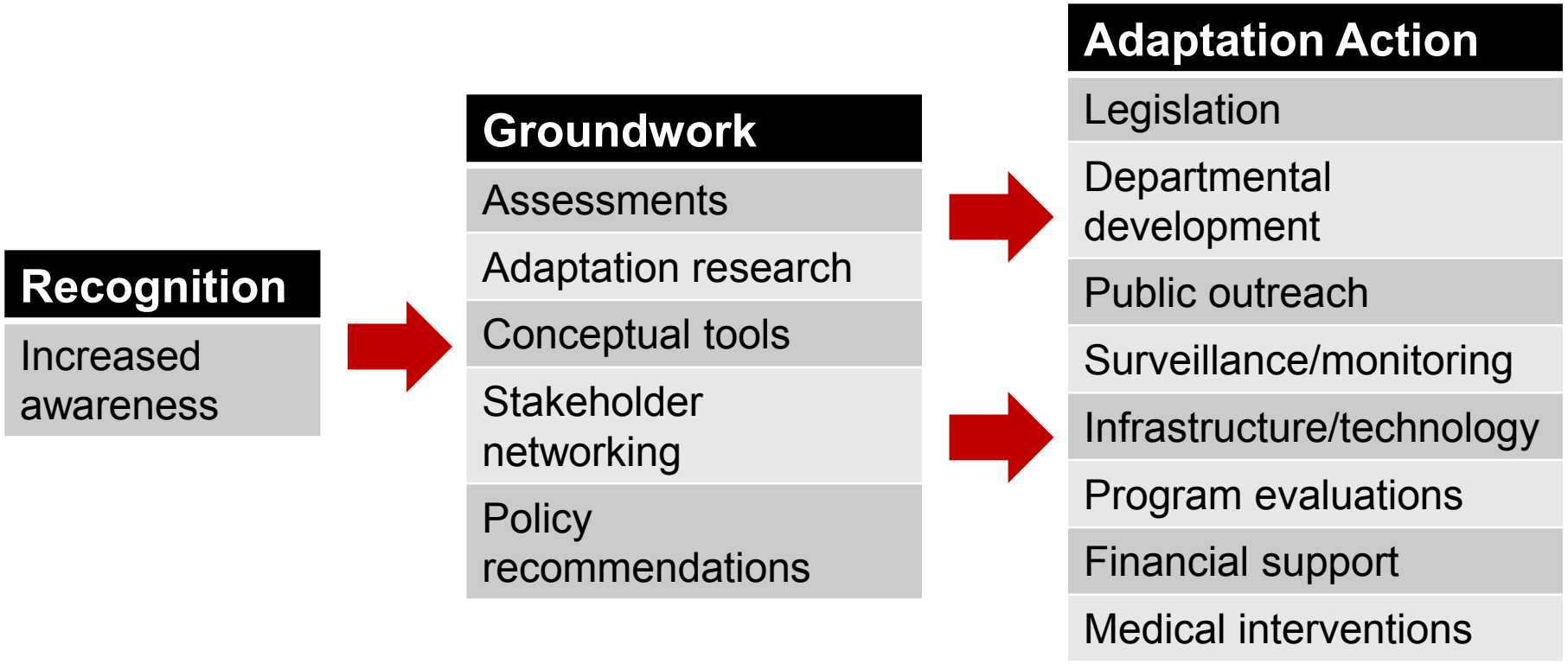
Growing Collaborative Efforts to Reduce Risks

Provincial, territorial and local health authorities in Canada are gaining more knowledge of climate change and health vulnerabilities through assessments and targeted research

Canadian Health Authorities are Adapting in Innovative Ways



Toward Health Adaptation Action



Lesnikowski, et al., 2013

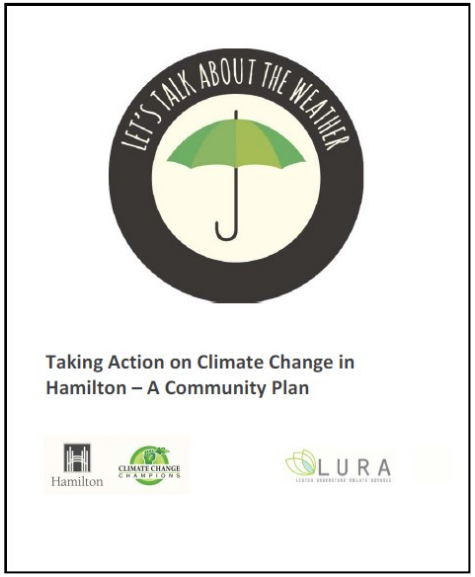
EM Action With and Without "Adaptation"

EM Action	EM + Adaptation
Hazard Risk VulnerabiliytAssessment	HRVA integrating climate change + CC assessments
Disaster mitigation	Disaster mitigation informed by CC drivers (e.g, UHI)
Disaster planning	Disaster plans – informed by CC (eg., simultaneous events)
Table top exercises	TTX with CC scenario
Surveillance	Monitoring new health risks
Response and recovery	Activate surge capacity
Increasing planning capacity	Partners with CC knowledge, staff aware of CC risks

City of Hamilton Climate Change Strategy - 2015

Theme: People and Health

Conduct a climate change and health vulnerability assessment



PRIORITY ACTION: Conduct a local community vulnerability assessment of public health impacts from climate change

Near-Term Initiatives	➢ Use climate change models to help identify health risks in Hamilton
	➢ Increase education and communication of the health risks of climate change in the community
	➢ Integrate climate change adaptation into health programs and services to the community to reduce vulnerability and exposure

http://climatechangehamilton.ca/plan/

What Health Canada is Doing

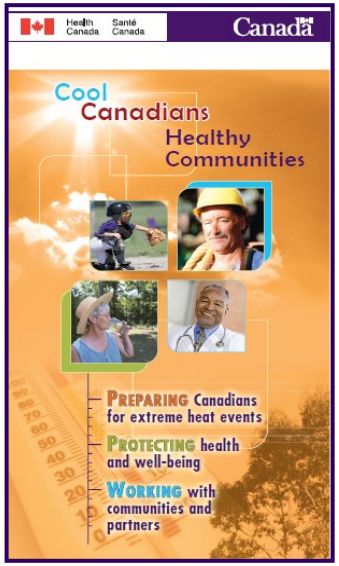
Climate Change and Health Adaptation of First Nations and Inuit

- Funded 95 community-led projects with linkages between traditional knowledge frameworks and academic sciences to reduce health risks to First Nation and Inuit communities.
- Projects engaged communities directly identifying and documenting:
  - changing distribution of animal and plant resources; traditional ecological knowledge
  - the need for energy efficient housing; sustainable homes; traditional housing, moss housing
  - precarious ice conditions; safety of sea ice; snow conditions and support for ongoing monitoring for prevention of injuries/mortality
  - access to food, preparation and distribution of food, food sharing, healthy foods, impact of climate change on consumption of traditional foods
- Communities developed further communications approaches, adaptation plans and adaptation actions to prepare to future change and adapt to current impacts

Developing Heat Resilient Communities and Individuals

- Since 2007 Health Canada has improved Canadian resiliency to heat in the following ways:
  - » Delivering **heat-health messaging** to support personal adaptation
  - » Conducting research into **heat-health science** to address knowledge gaps
  - » Disseminating **information for health care workers** through clinical training
  - » Expanding **Heat Alert and Response Systems** across Canada

- In 2011 the heat resiliency project provided:
  - » Pilot Heat Alert Response Systems in four Canadian communities (Fredericton, Winnipeg, Windsor, Melita)
  - » A Best Practices Guidebook on Heat Alert and Response Systems
  - » Guidelines for Health Care Workers regarding Extreme Heat Events



Science for Adaptation at the Local Level

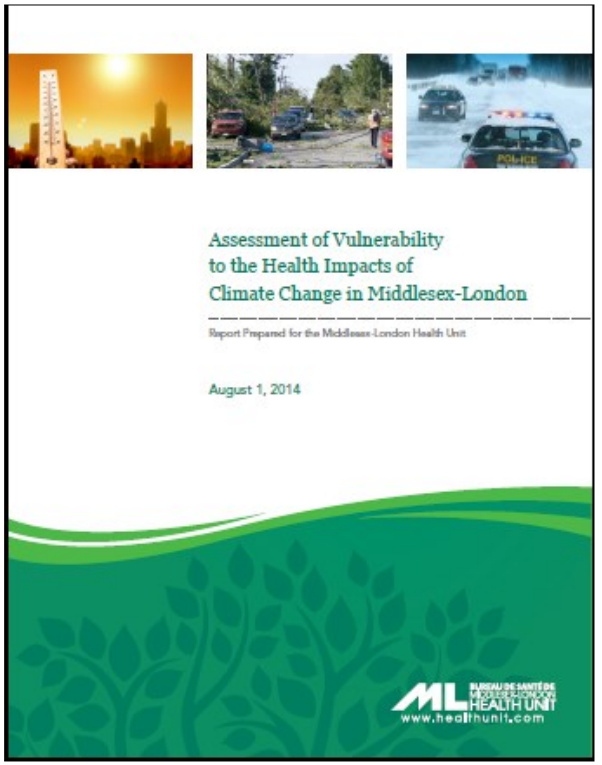
Middlesex-London Vulnerability Assessment

BUREAU DE SANTÉ DE MIDDLESEX-LONDON HEALTH UNIT
www.healthunit.com

Collected data on current risks and adaptations

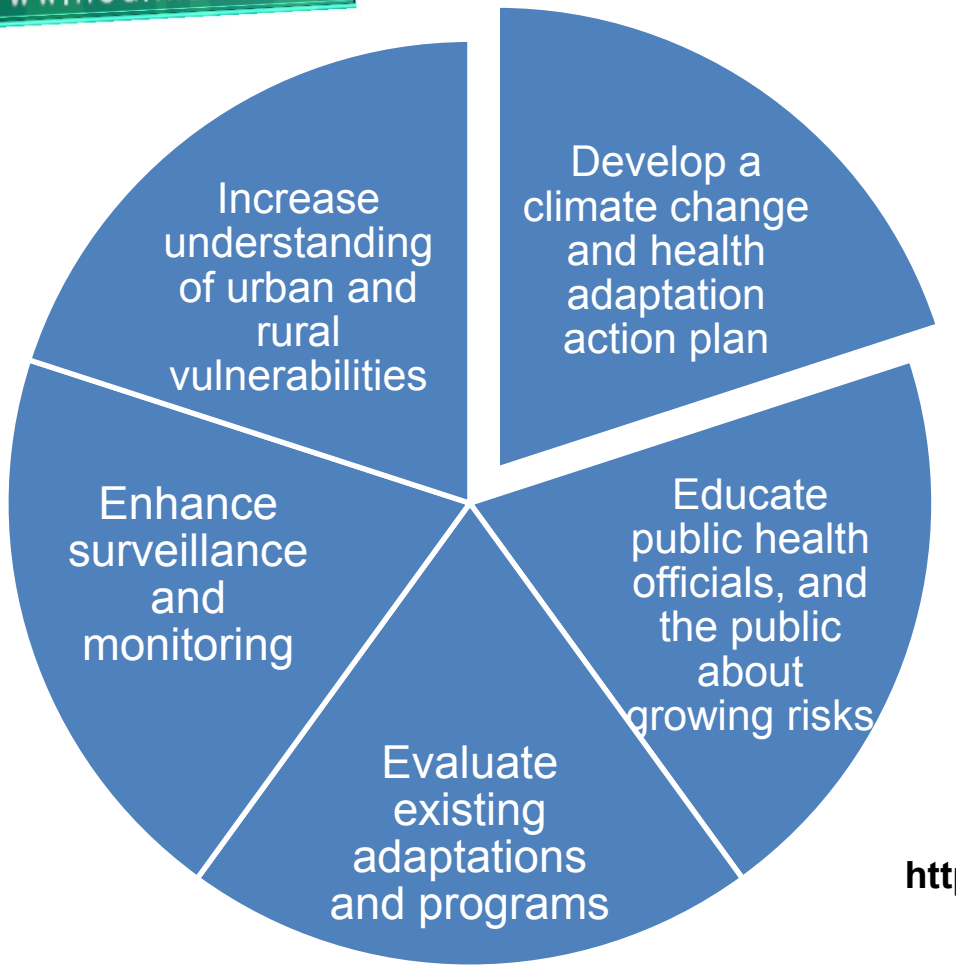
Modeled future risks with climate change

Engaged stakeholders on results and recommendations

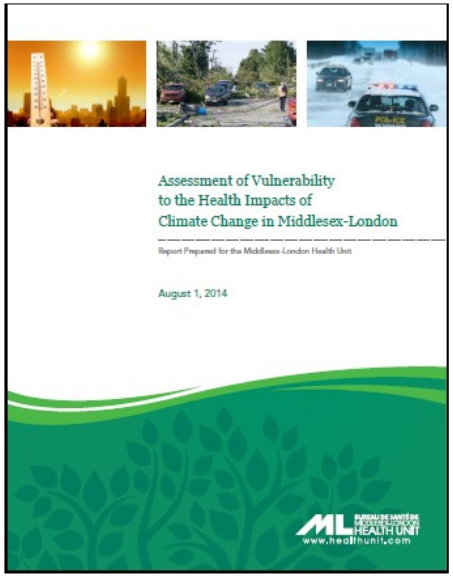


https://www.healthunit.com/climate-change

Middlesex-London Vulnerability Assessment



Key Recommendations



https://www.healthunit.com/climate-change

Health Facility Climate Change Resiliency

http://www.eenews.net/assets/2014/12/15/document_pm_02.pdf

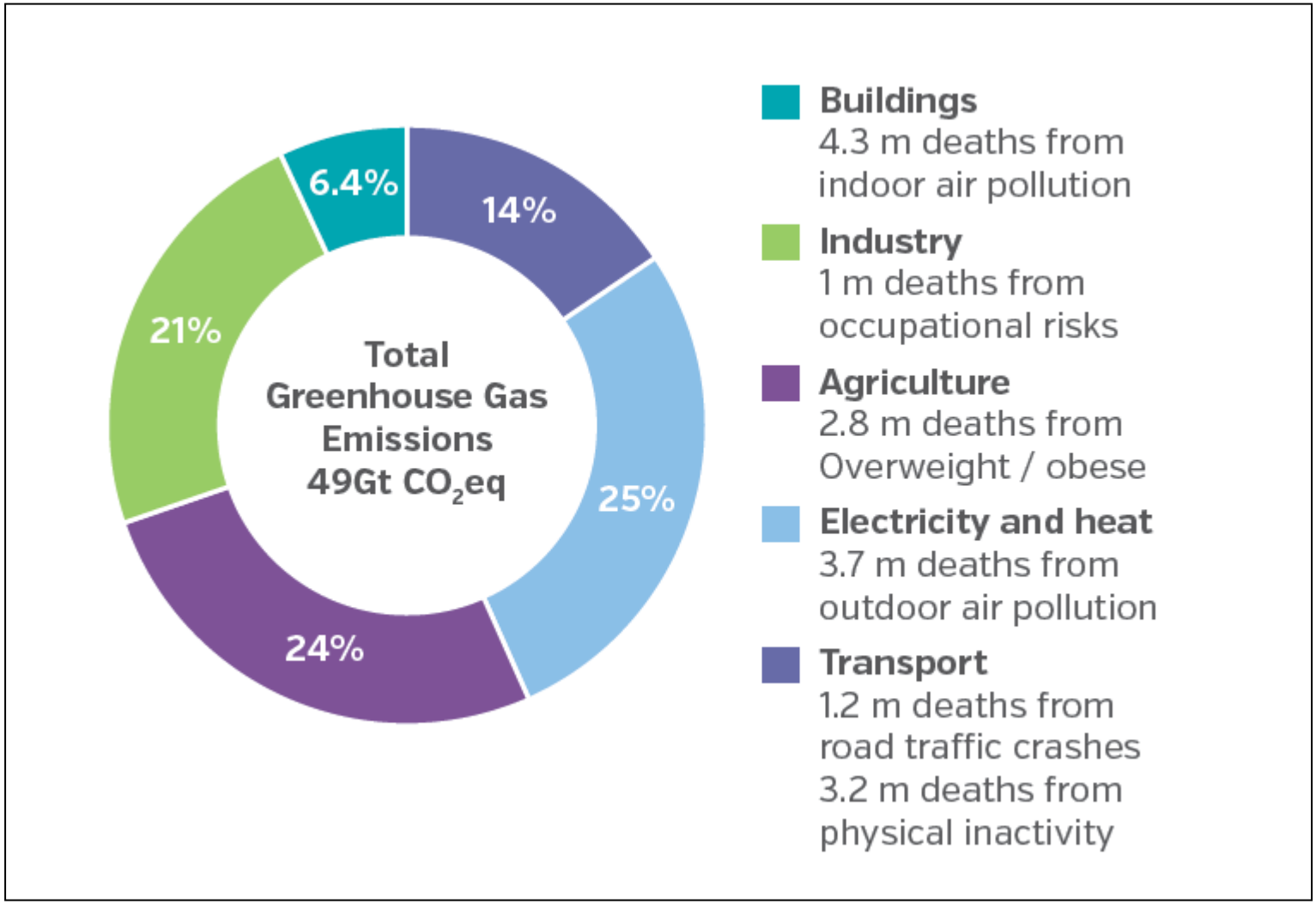
Primary Prevention: Enhancing Health Care Resiliency for a Changing Climate (US)

Health Care Facility Climate Change Resiliency Toolkit (Canada)

Strengthening the resilience of health systems would both save lives now, and protect populations from much of the potential health impacts of climate change at least until the middle of the coming century (WHO, 2015).

www.greenhealthcare.ca/climateresilienthealthcare/

Reducing GHGs and Health Burdens

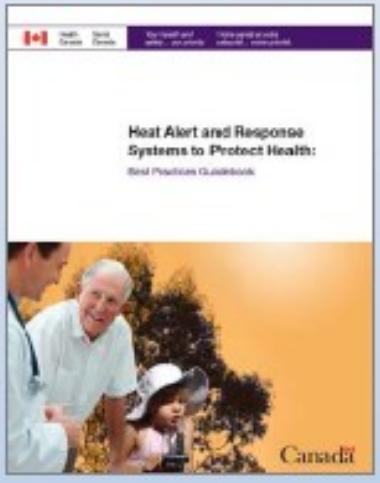


WHO, 2015

Resources from Health Canada

Communicating with the public

HARS Best Practices



Heat Adaptation Guidelines

http://www.hc-sc.gc.ca/ewh-semt/pubs/climat/index-eng.php

THANK YOU

For further information:

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http://www.hc-sc.gc.ca/ewh-semt/climat/index-eng.php